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ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 01/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

HG

Office Action Summary	Application No. 09/239,578	Applicant(s) SINGH, KAPIL D.
	Examiner Ayal I. Sharon	Art Unit 2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _28 January 1999_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-24_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _28 January 1999_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claims 1-24 of U.S. Application 09/239,578 filed on 01/28/1999 are presented for

examination.

Drawings

2. This application has been filed with drawings that are informal in nature and

objected to by the Draftsperson. This application has been filed with informal

drawings which are acceptable for examination purposes only. Formal drawings

will be required when the application is allowed.

Claim Objections

3. Claims 5, 12, 20 are objected to under 37 CFR 1.75(c). Applicant is required to

cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

dependent form, or rewrite the claim(s) in independent form. In Claims 5, 12, 20,

the term "selected ones of the design variables" is awkward. Should be:

"selected design variables".

4. Claims 6, 13, 21 are objected to under 37 CFR 1.75(c). Applicant is required to

cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

dependent form, or rewrite the claim(s) in independent form. In Claims 6, 13, 21

the term "to reuse" is ambiguous. Should be: "that indicates where to incorporate".

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 requires the following limitation: "replicating a sub-graph". However, this limitation is not adequately discussed in the specifications. Dependant claims 2-3 and 6-7 inherit this defect.

8. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention. Claim 1 requires the following limitation: "merging the replicated sub-graph ...". However, this limitation is not adequately discussed in the specifications. Dependant claims 2-6 inherit this defect.

9. Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 2 requires the following limitation: "identifying the sub-graph for replication". However, this limitation is not adequately discussed in the specifications.

10. Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 8 requires the following limitation: "to replicate a sub-graph". However, this limitation is not adequately discussed in the specifications. Dependant claims 9-10 and 13-15 inherit this defect.

11. Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 8 requires the following limitation: "to merge the replicated sub-graph ...". However, this limitation is not adequately discussed in the specifications. Dependant claims 9-13, and 15 inherit this defect.

12. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 9 requires the following limitation: "to identify the sub-graph for replication". However, this limitation is not adequately discussed in the specifications.

13. Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 16 requires the following limitation: "to replicate a sub-graph". However, this limitation is not adequately discussed in the specifications. Dependant claims 17, 18, 21, 23-24 inherit this defect.

14. Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as containing subject

matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention. Claim 16 requires the following

limitation: "to merge the replicated sub-graph ...". However, this limitation is not

adequately discussed in the specifications. Dependant claims 17-21, 23 and 24

inherit this defect.

15. Claim 17 is rejected under 35 U.S.C. 112, first paragraph, as containing subject

matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention. Claim 17 requires the following

limitation: "identify the sub-graph for replication". However, this limitation is not

adequately discussed in the specifications.

16. Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as containing subject

matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention. Claim 24 requires the following

limitation: "a first and second processor communicatively coupled to each other

to correspondingly execute the first and second plurality of programming

instructions". However, this limitation is not adequately discussed in the specifications.

17. Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 requires the following limitation: "to replicate a sub-graph". However, this limitation is not adequately discussed in the specifications.

18. Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 requires the following limitation: "means to merge the replicated sub-graph ...". However, this limitation is not adequately discussed in the specifications.

19. Claim 26 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 requires the following

limitation: "replicating a subset ...". However, this limitation is not adequately

discussed in the specifications.

20. Claim 26 is rejected under 35 U.S.C. 112, first paragraph, as containing subject

matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention. Claim 1 requires the following

limitation: "merging the replicated subset ...". However, this limitation is not

adequately discussed in the specifications.

Claim Interpretations

21. Examiner interprets "replication" and "replicating" as being equivalent to making

an exact copy.

22. Examiner interprets "merging" two graphs as being equivalent to connecting two

graphs.

23. Examiner interprets "dependent graph of a design" as being equivalent to a data

structure that supports Euler or "Euler-like" operations on boundary models. (See

Mäntylä, p. 174)

24. Examiner interprets "modeling information" (claims 1,8,16) as being equivalent to

node, segment or face identification or position data.

25. Examiner interprets "design variables" (claims 3, 5, 7, 10, 12, 14,18, 20, 22) as being variables derived from "modeling information", variables such as length of a line, orthogonal direction vector for a face, etc.

Claim Rejections - 35 USC § 101

26. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

27. Claims 1-7 and 26 are rejected under 35 U.S.C. 101 because the claimed invention is directed to an abstract idea and a mathematical algorithm, both of which are non-statutory subject matter. In the case *In re Warmerdam*, the Federal Circuit held that:

> "**the dispositive issue** for assessing compliance with Section 101 in this case is whether the Claim is for a process that goes beyond simply **manipulating "abstract ideas" or "natural phenomena"** ... As the Supreme Court has made clear, "[a]n idea of itself is not patentable, ... *taking several abstract ideas and manipulating them together adds nothing to the basic equation*." In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T Corp. v. Excel Communications, Inc* decision. In that case the court noted that:

"Finally, the decision in *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) *is not to the contrary.* *** The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that *"taking several abstract ideas and manipulating them together adds nothing to the basic equation"*; hence, the court held that the claims were properly rejected under §101 ... Whether one agrees with the court"s conclusion on the facts, the holding of the case is a *straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under §101."*(emphasis added) *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

28. In the present case, the Examiner finds that Applicant's inventions in Claims 1-7 and 26 are abstract ideas (mathematical algorithms from the field of graph theory) for manipulating graphs. Under *Warmerdam*, such inventions are not statutory. All dependant claims inherit this defect.

Claim Rejections - 35 USC § 102

29. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

30. The prior art cited is as follows:

31. "Challenges in feature-based manufacturing research", Mäntylä et al., Communications of the ACM, Vol. 39, Issue 2, pp.77-85, Feb. 1996. (henceforth "Mantyla_1")

32. An Introduction to Solid Modeling, Mäntylä. Computer Science Press, ISBN 0-7167-8015-1. 1988. (henceforth "Mantyla_2")

33. "Geometric modeling of solid objects by using a face adjacency graph

representation", Ansaldi et al., Proceedings of the SIGGRAPH '85 conference on

Computer Graphics, pp.131-139, 1985. (henceforth "Ansaldi")

34. The claims are subsequently recited for Applicant's convenience. Applicant's

attention is also directed to the pertinent sections of the prior art.

35. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 1:

> 1. A method comprising:
>   replicating a sub-graph from a first dependent graph of a first mechanical
> design, the first dependent graph having modeling information of the first
> mechanical design and the replicated sub-graph having modeling information of a
> subpart of the first mechanical design; (Mantyla_1: Fig.3, Fig.5, Fig.9)
>
>   merging the replicated sub-graph into a second dependent graph of a second
> mechanical design to reuse the subpart of the first mechanical design in the second
> mechanical design. (Mantyla_1: Fig.3, Fig.10, Fig.11)

36. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi. Ansaldi teaches the limitations of Claim 1:

> 1. A method comprising:
>   replicating a sub-graph from a first dependent graph of a first mechanical
> design, the first dependent graph having modeling information of the first
> mechanical design and the replicated sub-graph having modeling information of a
> subpart of the first mechanical design; (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)
>
>   merging the replicated sub-graph into a second dependent graph of a second
> mechanical design to reuse the subpart of the first mechanical design in the second
> mechanical design. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

37. Claims 2-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 1, as discussed.

Moreover, in regards to Claim 2:

> 2. The method of claim 1 further comprising receiving identification of the
> subpart of the first mechanical design, and in response, identifying the sub-graph for

replication. (Mantyla_1: Fig.3, Fig.5, Fig.9)

38. Claims 2-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi.   Ansaldi teaches the limitations of Claim 1, as discussed. Moreover, in

regards to Claim 2:

> 2. The method of claim 1 further comprising receiving identification of the
> subpart of the first mechanical design, and in response, identifying the sub-graph for
> replication. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

39. Claim 3-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 2, as discussed.

Moreover, in regards to Claims 3:

> 3. The method of claim 2, wherein
> 	said first dependent graph includes a first plurality of nodes correspondingly
> represent a first plurality of design variables of the first mechanical design, and a
> first plurality of arcs linking the first plurality of nodes in accordance with the first
> plurality of design variables' dependency on one another; and
> (Mantyla_1: Fig.3, Fig.5, Fig.9)
>
> 	said identification of the sub-graph for replication comprises correlating said
> received identification of the subpart to one or more nodes of said first plurality of
> nodes directly associated with the subpart, and following applicable ones of said first
> plurality of arcs to identify all other nodes of said first plurality of nodes to which the
> directly associated nodes are directly or indirectly dependent on.
> (Mantyla_1: Fig.3, Fig.5, Fig.9)

40. Claim 3-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi.   Ansaldi teaches the limitations of Claim 2, as discussed. Moreover, in

regards to Claims 3:

> 3. The method of claim 2, wherein
> 	said first dependent graph includes a first plurality of nodes correspondingly
> represent a first plurality of design variables of the first mechanical design, and a
> first plurality of arcs linking the first plurality of nodes in accordance with the first
> plurality of design variables' dependency on one another; and
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)
>
> 	said identification of the sub-graph for replication comprises correlating said
> received identification of the subpart to one or more nodes of said first plurality of

nodes directly associated with the subpart, and following applicable ones of said first
plurality of arcs to identify all other nodes of said first plurality of nodes to which the
directly associated nodes are directly or indirectly dependent on.
(Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

41. Claims 4-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 3, as discussed.

Moreover, in regards to Claim 4:

> 4. The method of claim 3 wherein said replication comprises copying said
> directly associated nodes, said nodes on which the directly associated nodes are
> dependent on, and the arcs linking these nodes to one another.
> (Mantyla_1: Fig.3, Fig.5, Fig.9)

42. Claims 4-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi.   Ansaldi teaches the limitations of Claim 3, as discussed. Moreover, in

regards to Claim 4:

> 4. The method of claim 3 wherein said replication comprises copying said
> directly associated nodes, said nodes on which the directly associated nodes are
> dependent on, and the arcs linking these nodes to one another.
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

43. Claim 5 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 4, as discussed.

Moreover, in regards to Claim 5:

> 5. The method of claim 4, wherein
>   selected ones of the design variables of said replicated sub-graph are set to
> constant values, while others are eligible to have values variably assigned; and
> (Mantyla_1: Fig.3, Fig.5, Fig.9)
>
>   the method further comprises receiving instructions to transform selected
> ones of the design variables set to constant values to design variables eligible for
> having values variably assigned, or to transform selected ones of the design
> variables eligible for having values variably assigned to having constant values
> assigned.
> (Mantyla_1: Fig.3, Fig.5, Fig.9)

It is inherent that when making changes to an existing CAD/CAM drawing,

certain parameters remain constant, while others are changed. Moreover, when

making a sequence of changes to a geometric shape (e.g. elongating a cylinder),

a parameter that is changed in a given step is held constant in other steps. So, it

is inherent that variables that are changed go from being constant to being

variable, and vice versa.

44. Claim 5 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi.   Ansaldi teaches the limitations of Claim 4, as discussed. Moreover, in

regards to Claim 5:

> 5. The method of claim 4, wherein
>   selected ones of the design variables of said replicated sub-graph are set to
> constant values, while others are eligible to have values variably assigned; and
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)
>
>   the method further comprises receiving instructions to transform selected
> ones of the design variables set to constant values to design variables eligible for
> having values variably assigned, or to transform selected ones of the design
> variables eligible for having values variably assigned to having constant values
> assigned.
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

It is inherent that when making changes to an existing CAD/CAM drawing,

certain parameters remain constant, while others are changed. Moreover, when

making a sequence of changes to a geometric shape (e.g. elongating a cylinder),

a parameter that is changed in a given step is held constant in other steps. So, it

is inherent that variables that are changed go from being constant to being

variable, and vice versa.

45. Claims 6-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 1, as discussed.

Moreover, in regards to Claims 6:

> 6.   The method of claim 1 further comprising receiving identification of a point or
> an area of the second mechanical design to reuse the subpart of the first
> mechanical design in the second mechanical design.
> (Mantyla_1: Fig.3, Fig.5, Fig.9)

46. Claims 6-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi.   Ansaldi teaches the limitations of Claim 1, as discussed. Moreover, in

regards to Claims 6:

> 6.   The method of claim 1 further comprising receiving identification of a point or
> an area of the second mechanical design to reuse the subpart of the first
> mechanical design in the second mechanical design.
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

47. Claim 7 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 6, as discussed.

Moreover, in regards to Claim 7:

> 7.   The method of claim 6, wherein said second dependent graph includes a second
> plurality of nodes correspondingly represent a second plurality of design variables of the
> second mechanical design, and a second plurality of arcs linking the second plurality of
> nodes in accordance with the second plurality of design variables' dependency on one
> another; and
> (Mantyla_1: Fig.3, Fig.5, Fig.9)
>
> said merging comprises correlating said received identification of the
> point/area to one or more nodes of said second plurality of nodes directly associated
> with the identified point/area, and attaching the replicated sub-graph to the second
> dependent graph by selectively linking nodes of the replicated sub-graph to the
> correlated nodes of the second dependent graph.
> (Mantyla_1: Fig.3, Fig.5, Fig.9)

48. Claim 7 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi. Ansaldi teaches the limitations of Claim 6, as discussed. Moreover, in

regards to Claim 7:

> 7. The method of claim 6, wherein said second dependent graph includes a second plurality of nodes correspondingly represent a second plurality of design variables of the second mechanical design, and a second plurality of arcs linking the second plurality of nodes in accordance with the second plurality of design variables' dependency on one another; and
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)
>
> said merging comprises correlating said received identification of the point/area to one or more nodes of said second plurality of nodes directly associated with the identified point/area, and attaching the replicated sub-graph to the second dependent graph by selectively linking nodes of the replicated sub-graph to the correlated nodes of the second dependent graph.
> (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

49. Claims 8-15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 8:

> 8. An article of manufacture comprising:
> a recordable medium having recorded thereon a plurality of programming instructions for use to program an apparatus to enable the apparatus to be able to replicate a sub-graph from a first dependent graph of a first mechanical design, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first -mechanical design, and to be able to merge the replicated sub-graph into a second dependent graph of a second mechanical design to reuse the subpart of the first mechanical design in the second mechanical design.
> (Mantyla_1: pp.77-78, Fig. 2, Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that a computer-aided design (CAD) or computer-aided

manufacturing (CAM) system, as described in Mantyla_1, utilize a recordable

medium in order to store work that is performed. It is also inherent that

CAD/CAM systems, being computer systems, require programming instructions

(as described in Mantyla_1) in order to function. Moreover, Official Notice is

given that it is inherent that CAD/CAM programming instructions are stored on

recordable medium.

50. Claims 9-12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 8, as discussed.

Moreover, in regards to Claim 9:

> 9.   The article of claim 8, wherein the programming instructions further enable
> the apparatus to be able to receive identification of the subpart of the first
> mechanical design, and in response, identify the sub-graph for replication.
> (Mantyla_1: Fig.9, and p.83 col.1 to p.83 col.2)

51. Claims 10-12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 9, as discussed.

Moreover, in regards to Claim 10:

> 10.   The article of claim 9, wherein
>   said first dependent graph includes a first plurality of nodes correspondingly
> represent a first plurality of design variables of the first mechanical design, and a
> first plurality of arcs linking the first plurality of nodes in accordance with the first
> plurality of design variables' dependency on one another; and
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)
>
>   the programming instructions further enable the apparatus to be able to
> identify the sub-graph for replication by correlating said received identification to one
> or more nodes of said first plurality of nodes directly associated with the subpart,
> and then following applicable ones of said first plurality of arcs to identify all other
> nodes of said first plurality of nodes to which the directly associated nodes are
> directly or indirectly dependent on.
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)

52. Claims 11-12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 10, as discussed.

Moreover, in regards to Claim :

> 11.   The article of claim 10 wherein the programming instructions further enable
> the apparatus to be able to replicate the identified sub-graph by copying said directly
> associated nodes, said nodes the directly associated nodes are dependent on, and
> the arcs linking these nodes to one another.
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)

53. Claim 12 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 11, as discussed.

Moreover, in regards to Claim 12:

> 12.   The article of claim 11, wherein
> selected ones of the design variables of said replicated sub-graph are set to
> constant values, while others are eligible to have values variably assigned; and
> the programming instructions further enable the apparatus to be able to
> receive instructions to transform selected ones of the design variables set to
> constant values to design variables eligible for having values variably assigned, or to
> transform selected ones of the design variables eligible for having values variably
> assigned to having constant values assigned.
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that when making changes to an existing CAD/CAM drawing,

certain parameters remain constant, while others are changed. Moreover, when

making a sequence of changes to a geometric shape, a parameter that is

changed in a given step (e.g. height is changed when elongating a cylinder) is

held constant in other steps (e.g. height is constant when increasing the radius of

a cylinder). So, it is inherent that variables that are changed go from being

constant to being variable, and vice versa.

54. Claims 13-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 8, as discussed.

Moreover, in regards to Claim 13:

> 13.   The article of claim 8, wherein the programming instructions further enable
> the apparatus to be able to receive identification of a point or an area of the second
> mechanical design to reuse the subpart of the first mechanical design in the second
> mechanical design.
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)

55. Claim 14 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 13, as discussed.

Moreover, in regards to Claim 14:

> 14.   The article of claim 13, wherein
>   said second dependent graph includes a second plurality of nodes
> correspondingly represent a second plurality of design variables of the second
> mechanical design, and a second plurality of arcs linking the second plurality of
> nodes in accordance with the second plurality of design variables' dependency on
> one another; and
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)
>
>   the programming instructions further enable the apparatus to be able to
> correlate the received identification of the point/area to one or more nodes of said
> second plurality of nodes directly associated with the identified point/area, and to
> attach the replicated sub-graph to the second dependent graph by selectively linking
> nodes of the replicated sub-graph to the correlated nodes of the second dependent
> graph.
> (Mantyla_1: Fig.9, and p.83 col.1 to p.84 col.2)

56. Claim 15 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 8, as discussed.

Moreover, in regards to Claims 15:

> 15. The article of claim 8, wherein the programming instructions are integral part
> of a computer aided design tool.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

57. Claims 16-24 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 16:

> 16.   An apparatus comprising:
> at least one storage medium having stored therein a first and a second
> plurality of programming instructions; and
> (Mantyla_1: p.77, and Fig.2)
>
>   at least one processor coupled to the at least on storage medium to execute
> the first plurality of programming instructions to replicate a sub-graph from a first
> dependent graph of a first mechanical design, the first dependent graph having
> modeling information of the first mechanical design and the replicated sub-graph
> having modeling information of a subpart of the first mechanical design, and to
> execute the second plurality of programming instructions to merge the replicated
> sub-graph into a second dependent graph of a second mechanical design to reuse
> the subpart of the first mechanical design in the second mechanical design.

(Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

Mantyla_1 teaches the creation and merging of graphs and sub-graphs as

descried in the claim, (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to

p.84 col.2). Moreover, Mantyla_1 specifically teaches the creation of CAD/CAM

systems.

However, Mantyla_1 does not specifically teach the use of a storage medium

having a plurality of programming instructions, nor of the use of a processor..

Official Notice is given that at the time of the invention, it was inherent that a

CAD/CAM system would use a storage medium (e.g. hard-drive, CD-ROM,

floppy disk) in order to store software applications or the files generated by

software applications. Also, Official Notice is given that at the time of the

invention, it was inherent a CAD/CAM system had a least one computer, and

therefore had at least one processor.

58. Claims 17-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 16, as discussed.

Moreover, in regards to Claims 17:

> 17. The apparatus of claim 16, wherein the at least one processor further
> executes the second plurality of programming instructions to receive identification of
> the subpart of the first mechanical design, and in response, identify the sub-graph
> for replication. (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

59. Claims 18-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 17, as discussed.

Moreover, in regards to Claim 18:

> 18.The apparatus of claim 17, wherein said first dependent graph includes a first plurality
> of nodes correspondingly
> represent a first plurality of design variables of the first mechanical design, and a
> first plurality of arcs linking the first plurality of nodes in accordance with the first
> plurality of design variables' dependency on one another; and
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)
>
> the at least one processor further executes the first plurality of programming
> instructions to identify the sub-graph for replication by correlating said received
> identification of the subpart to one or more nodes of said first plurality of nodes
> directly associated with the identified subpart, and to follow applicable ones of said
> first plurality of arcs to identify all other nodes of said first plurality of nodes to which
> the directly associated nodes are directly or indirectly dependent on.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

60. Claims 19-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 18, as discussed.

Moreover, in regards to Claim 19:

> 19.The apparatus of claim 18 wherein the at least one processor further
> executes the first plurality of programming instructions to replicate the identified sub
> graph by copying said directly associated nodes, said nodes on which the directly
> associated nodes are dependent on, and the arcs linking the these nodes to one
> another. (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that a CAD/CAM system is able to produce copies ("replications") of

drawings produced on that system.

61. Claim 20 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 19, as discussed.

Moreover, in regards to Claim 20:

> 20. The apparatus of claim 19, wherein
> selected ones of the design variables of said replicated sub-graph are set to
> constant values, while others are eligible to have values variably assigned; and
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)
>
> the at least one processor further executes the second plurality of
> programming instructions to receive instructions to transform selected ones of the
> design variables set to constant values to design variables eligible for having values
> variably assigned, or to transform selected ones of the design variables eligible for
> having values variably assigned to having constant values assigned.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that when making changes to an existing CAD/CAM drawing,

certain parameters remain constant, while others are changed. Moreover, when

making a sequence of changes to a geometric shape, a parameter that is

changed in a given step (e.g. height is changed when elongating a cylinder) is

held constant in other steps (e.g. height is constant when increasing the radius of

a cylinder). So, it is inherent that variables that are changed go from being

constant to being variable, and vice versa.

Moreover, Official Notice is given that at the time of the invention, it was

inherent a CAD/CAM system had a least one computer, and therefore had at

least one processor.

62. Claims 21-22 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 16, as discussed.

Moreover, in regards to Claim 21:

> 21. The apparatus of claim 16, wherein the at least one processor further
> executes the second plurality of programming instructions to receive identification of
> a point or an area of the second mechanical design to reuse the subpart of the first
> mechanical design in the second mechanical design.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

63. Claim 22 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 21, as discussed.

Moreover, in regards to Claim 22:

> 22. The apparatus of claim 21, wherein
>   said second dependent graph includes a second plurality of nodes
> correspondingly represent a second plurality of design variables of the second
> mechanical design, and a second plurality of arcs linking the second plurality of
> nodes in accordance with the second plurality of design variables' dependency on
> one another; and
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)
>
>   the at least one processor further executes the second plurality of
> programming instructions to correlate the received identification of the point/area to
> one or more nodes of said second plurality of nodes directly associated with the
> identified point/area, and to attach the replicated sub-graph to the second
> dependent graph by selectively linking nodes of the replicated sub-graph to the
> correlated nodes of the second dependent graph.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

64. Claim 23 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 16, as discussed.

Moreover, in regards to Claims 23:

> 23. The apparatus of claim 16, wherein the at least one processor consists of a
> processor executing both the first and second plurality of programming instructions.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

65. Claim 25 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 25:

> 25. An apparatus comprising:
> means to replicate a subset of a first modeling representation of a first
> mechanical design responsive to instructions identifying a subpart of the first
> mechanical design;
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)
>
> means to merge the replicated subset into a second modeling representation
> of a second mechanical design to reuse the identified subpart of the first mechanical
> design in the second mechanical design.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

66. Claim 25 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi. Ansaldi teaches the limitations of Claim 25:

> 25. An apparatus comprising:
> means to replicate a subset of a first modeling representation of a first
> mechanical design responsive to instructions identifying a subpart of the first
> mechanical design;
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> means to merge the replicated subset into a second modeling representation
> of a second mechanical design to reuse the identified subpart of the first mechanical
> design in the second mechanical design.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

67. Claim 26 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Mantyla_1. Mantyla_1 teaches the limitations of Claim 26:

> 26. A method comprising the steps of:
> replicating a subset of a first modeling representation of a first mechanical
> design responsive to instructions identifying a subpart of the first mechanical design;
> and
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)
>
> merging the replicated subset into a second modeling representation of a
> second mechanical design to reuse the identified subpart of the first mechanical
> design in the second mechanical design.
> (Mantyla_1: p.77, and Fig.2, and Fig.9, and p.83 col.1 to p.84 col.2)

68. Claim 26 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by

Ansaldi. Ansaldi teaches the limitations of Claim 26:

> 26. A method comprising the steps of:
>   replicating a subset of a first modeling representation of a first mechanical
> design responsive to instructions identifying a subpart of the first mechanical design;
> and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
>   merging the replicated subset into a second modeling representation of a
> second mechanical design to reuse the identified subpart of the first mechanical
> design in the second mechanical design.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Claim Rejections - 35 USC § 103

69. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

70. Claims 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi. The applicant claims:

> 8.   An article of manufacture comprising:
>   a recordable medium having recorded thereon a plurality of programming
> instructions for use to program an apparatus to enable the apparatus to be able to
> replicate a sub-graph from a first dependent graph of a first mechanical design, the
> first dependent graph having modeling information of the first mechanical design
> and the replicated sub-graph having modeling information of a subpart of the first
> -mechanical design, and to be able to merge the replicated sub-graph into a second
> dependent graph of a second mechanical design to reuse the subpart of the first
> mechanical design in the second mechanical design.

Ansaldi teaches the creation and merging of graphs and sub-graphs as descried in the claim, (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138). Moreover, Ansaldi specifically teaches that "... we designed an experimental geometric modeling system for defining and manipulating the boundary of three-dimensional objects with planar faces, so as to demonstrate the practical advantages deriving from the use of our model in a CAD application." (p.131 last paragraph). However, Ansaldi does not specifically teach the use of a recordable medium having a plurality of programming instructions.

Official Notice is given that at the time of the invention, it was obvious and well known to one of ordinary skill in the art to utilize a recordable medium (e.g. hard-drive, CD-ROM, floppy disk) in order to store software applications or the files generated by software applications.

Moreover, at the time of the invention, it would have obvious to one of ordinary skill in the art to use a recordable medium in conjunction with the teachings of Ansaldi in order to be able to store work that is performed.

71. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi. Ansaldi teaches the limitations of Claim 8, as discussed. Moreover, Ansaldi teaches the limitations of Claim 9:

> 9. The article of claim 8, wherein the programming instructions further enable the apparatus to be able to receive identification of the subpart of the first mechanical design, and in response, identify the sub-graph for replication. (Ansaldi: p.131 last paragraph)

72. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi.   Ansaldi teaches the limitations of Claim 9, as discussed. Moreover,

Ansaldi teaches the limitations of Claim 10:

> 10.   The article of claim 9, wherein
>   said first dependent graph includes a first plurality of nodes correspondingly
> represent a first plurality of design variables of the first mechanical design, and a
> first plurality of arcs linking the first plurality of nodes in accordance with the first
> plurality of design variables' dependency on one another; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
>   the programming instructions further enable the apparatus to be able to
> identify the sub-graph for replication by correlating said received identification to one
> or more nodes of said first plurality of nodes directly associated with the subpart,
> and then following applicable ones of said first plurality of arcs to identify all other
> nodes of said first plurality of nodes to which the directly associated nodes are
> directly or indirectly dependent on.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

73. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi.   Ansaldi teaches the limitations of Claim 10, as discussed. Moreover,

Ansaldi teaches the limitations of Claim 11:

> 11.   The article of claim 10 wherein the programming instructions further enable
> the apparatus to be able to replicate the identified sub-graph by copying said directly
> associated nodes, said nodes the directly associated nodes are dependent on, and
> the arcs linking these nodes to one another.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

74. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi.

Ansaldi teaches the limitations of Claim 11, as discussed. Moreover, in regards

to Claim 12:

> 12.   The article of claim 11, wherein
> selected ones of the design variables of said replicated sub-graph are set to
> constant values, while others are eligible to have values variably assigned; and
> the programming instructions further enable the apparatus to be able to
> receive instructions to transform selected ones of the design variables set to
> constant values to design variables eligible for having values variably assigned, or to
> transform selected ones of the design variables eligible for having values variably
> assigned to having constant values assigned.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Ansaldi does not specifically teach design variables that are set to either constant

or variable values. However, at the time of the invention, it would have been

obvious to one of ordinary skill in the art that when making changes to an existing

CAD/CAM drawing, certain parameters remain constant, while others are

changed. Moreover, it would have been obvious that when making a sequence of

changes to a geometric shape, a parameter that is changed in a given step (e.g.

height is changed when elongating a cylinder) is held constant in other steps

(e.g. height is constant when increasing the radius of a cylinder). It would have

been obvious at the time of the invention to include this feature because without

this feature, neither the prior art nor the invention will work.

75. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi. Ansaldi teaches the limitations of Claim 8, as discussed. Moreover,

Ansaldi teaches the limitations of Claim 13:

> 13.   The article of claim 8, wherein the programming instructions further enable
> the apparatus to be able to receive identification of a point or an area of the second
> mechanical design to reuse the subpart of the first mechanical design in the second
> mechanical design.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

76. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi.

Ansaldi teaches the limitations of Claim 13, as discussed. Moreover, Ansaldi

teaches the limitations of Claim 14:

> 14.   The article of claim 13, wherein
>   said second dependent graph includes a second plurality of nodes
> correspondingly represent a second plurality of design variables of the second
> mechanical design, and a second plurality of arcs linking the second plurality of
> nodes in accordance with the second plurality of design variables' dependency on
> one another; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

> the programming instructions further enable the apparatus to be able to
> correlate the received identification of the point/area to one or more nodes of said
> second plurality of nodes directly associated with the identified point/area, and to
> attach the replicated sub-graph to the second dependent graph by selectively linking
> nodes of the replicated sub-graph to the correlated nodes of the second dependent
> graph.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

77. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi.

Ansaldi teaches the limitations of Claim 8, as discussed. Moreover, Ansaldi

teaches the limitations of Claims 15:

> 15. The article of claim 8, wherein the programming instructions are integral part
> of a computer aided design tool.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

78. Claims 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi. The applicant claims:

> 16.   An apparatus comprising:
> at least one storage medium having stored therein a first and a second
> plurality of programming instructions; and
>
>   at least one processor coupled to the at least on storage medium to execute
> the first plurality of programming instructions to replicate a sub-graph from a first
> dependent graph of a first mechanical design, the first dependent graph having
> modeling information of the first mechanical design and the replicated sub-graph
> having modeling information of a subpart of the first mechanical design, and to
> execute the second plurality of programming instructions to merge the replicated
> sub-graph into a second dependent graph of a second mechanical design to reuse
> the subpart of the first mechanical design in the second mechanical design.

Ansaldi teaches the creation and merging of graphs and sub-graphs as descried

in the claim, (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138). Moreover, Ansaldi

specifically teaches that "... we designed an experimental geometric modeling

system for defining and manipulating the boundary of three-dimensional objects

with planar faces, so as to demonstrate the practical advantages deriving from

the use of our model in a CAD application." (p.131 last paragraph). However,

Ansaldi does not specifically teach the use of a storage medium having a

plurality of programming instructions, nor of the use of a processor..

Official Notice is given that at the time of the invention, it was obvious and well

known to one of ordinary skill in the art to utilize a storage medium (e.g. hard-

drive, CD-ROM, floppy disk) in order to store software applications or the files

generated by software applications. Also, Official Notice is given that at the time

of the invention, it was obvious and well known to one of ordinary skill in the art

that the computer(s) in a CAD/CAM system have one or more processors.

Moreover, at the time of the invention, it would have obvious to one of

ordinary skill in the art to use a storage medium in conjunction with a processor

and with the teachings of Ansaldi, because otherwise the "CAD application"

would not work.

79. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi.   Ansaldi teaches the limitations of Claim 16, as discussed. Moreover, in

regards to Claims 17:

> 17. The apparatus of claim 16, wherein the at least one processor further
> executes the second plurality of programming instructions to receive identification of
> the subpart of the first mechanical design, and in response, identify the sub-graph
> for replication. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

80. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi. Ansaldi teaches the limitations of Claim 17, as discussed. Moreover, in

regards to Claim 18:

> 18.The apparatus of claim 17, wherein said first dependent graph includes a first plurality of nodes correspondingly
> represent a first plurality of design variables of the first mechanical design, and a first plurality of arcs linking the first plurality of nodes in accordance with the first plurality of design variables' dependency on one another; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> the at least one processor further executes the first plurality of programming instructions to identify the sub-graph for replication by correlating said received identification of the subpart to one or more nodes of said first plurality of nodes directly associated with the identified subpart, and to follow applicable ones of said first plurality of arcs to identify all other nodes of said first plurality of nodes to which the directly associated nodes are directly or indirectly dependent on.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

81. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi. Ansaldi teaches the limitations of Claim 18, as discussed. Moreover,

Ansaldi teaches the limitations of Claim 19:

> 19.The apparatus of claim 18 wherein the at least one processor further executes the first plurality of programming instructions to replicate the identified sub graph by copying said directly associated nodes, said nodes on which the directly associated nodes are dependent on, and the arcs linking the these nodes to one another. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system is able to produce copies ("replications") of

drawings produced on that system.

82. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi.

Ansaldi teaches the limitations of Claim 19, as discussed. Moreover, in regards

to Claim 20:

> 20. The apparatus of claim 19, wherein
> selected ones of the design variables of said replicated sub-graph are set to
> constant values, while others are eligible to have values variably assigned; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> the at least one processor further executes the second plurality of
> programming instructions to receive instructions to transform selected ones of the
> design variables set to constant values to design variables eligible for having values
> variably assigned, or to transform selected ones of the design variables eligible for
> having values variably assigned to having constant values assigned.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that when making changes to an existing CAD/CAM drawing,

certain parameters remain constant, while others are changed. Moreover, when

making a sequence of changes to a geometric shape, a parameter that is

changed in a given step (e.g. height is changed when elongating a cylinder) is

held constant in other steps (e.g. height is constant when increasing the radius of

a cylinder). It would have been obvious at the time of the invention to include this

feature because without this feature, neither the prior art nor the invention will

work.

83. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ansaldi. Ansaldi teaches the limitations of Claim 16, as discussed. Moreover,

Ansaldi teaches the limitations of Claim 21:

> 21. The apparatus of claim 16, wherein the at least one processor further
> executes the second plurality of programming instructions to receive identification of
> a point or an area of the second mechanical design to reuse the subpart of the first
> mechanical design in the second mechanical design.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, will have at least one processor to execute the programming instructions.

84. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi.

Ansaldi teaches the limitations of Claim 21, as discussed. Moreover, Ansaldi

teaches the limitations of Claim 22:

> 22. The apparatus of claim 21, wherein
> said second dependent graph includes a second plurality of nodes
> correspondingly represent a second plurality of design variables of the second
> mechanical design, and a second plurality of arcs linking the second plurality of
> nodes in accordance with the second plurality of design variables' dependency on
> one another; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> the at least one processor further executes the second plurality of
> programming instructions to correlate the received identification of the point/area to
> one or more nodes of said second plurality of nodes directly associated with the
> identified point/area, and to attach the replicated sub-graph to the second
> dependent graph by selectively linking nodes of the replicated sub-graph to the
> correlated nodes of the second dependent graph.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

85. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi.

Ansaldi teaches the limitations of Claim 16, as discussed. Moreover, Ansaldi

teaches the limitations of Claims 23:

> 23. The apparatus of claim 16, wherein the at least one processor consists of a
> processor executing both the first and second plurality of programming instructions.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, will have at

least one processor to execute the programming instructions.

86. Claim 24 is rejected under 35 U.S.C. 102(b) as being 35 U.S.C. 103(a) as being

unpatentable over Mantyla_1. Mantyla_1 teaches the limitations of Claim 16, as

discussed. Moreover, in regards to Claims 24:

>24. The apparatus of claim 16, wherein the at least one processor comprises a
> first and a second processor communicatively coupled to each other to
> correspondingly execute the first and second plurality of programming instructions.

Mantyla_1 does not teach the use of two coupled processors to execute the programming instructions. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a personal computer that had both a CPU, as well as graphics-specific processor embedded in a "graphics card" in order to speed up the execution time of the software.

87. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi. Ansaldi teaches the limitations of Claim 16, as discussed. Moreover, in regards to Claims 24:

>24. The apparatus of claim 16, wherein the at least one processor comprises a
> first and a second processor communicatively coupled to each other to
> correspondingly execute the first and second plurality of programming instructions.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Ansaldi does not teach the use of two coupled processors to execute the programming instructions. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a personal computer that had both a CPU, as well as graphics-specific processor embedded in a "graphics card" in order to speed up the execution time of the software.

Conclusion

88. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.

89. "List of Publications: Martti Mäntylä", http://www.cs.hut.fi/~mam/publ.html

(henceforth "Mantyla_3")

90. "Model-Based Orientation-Independent 3-D Machine Vision Techniques", de

Figueiredo et al., IEEE Transactions on Aerospace and Electronics Systems, Vol.

24, No. 5, pp. 597-607, Sept. 1988. (henceforth "de Figueiredo")

Correspondence Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Ayal I. Sharon whose telephone number is

(703) 306-0297. The examiner can normally be reached on Monday through Thursday,

and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kevin Teska can be reached on (703) 305-9704. Any response to this office

action should be mailed to:

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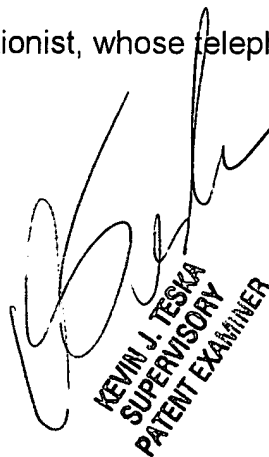   Official communications: (703) 746-7239
        Non-Official / Draft communications   (703) 746-7240
        After Final communications   (703) 746-7238

      Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist, whose telephone number is:

(703) 305-3900.

Ayal I. Sharon

Art Unit 2123

January 18, 2002

KEVIN J. TESKA
SUPERVISORY
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